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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/728,865   | 12/08/2003  | Masaki Matsushita    | 1248-0682P          | 1180             |
| 2292   | 7590        | 07/05/2005           | EXAMINER            |                  |
| BIRCH STEWART KOLASCH & BIRCH<br>PO BOX 747<br>FALLS CHURCH, VA 22040-0747 |             |                      | VO, ANH T N         |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2861                |                  |

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/728,865

Applicant(s)

MATSUSHITA ET AL.

Examiner

Anh T.N. Vo

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 4-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/08/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

The references cited on PTO 1449 have been considered.

## CLAIM REJECTIONS

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3 and 11 are rejected under 35 USC 102 (b) as being anticipated by Heinzl et al. (US Pat. 4,149,172).

Heinzl et al. discloses in Figures 1-4 an ink supply system comprising:

- an ink tank (9) storing ink;
- an ink supply tube (8) supplying the ink from the ink tank (9) to a print head (1), wherein the ink supply tube (8) is provided with a bubble catching section (5) for catching bubbles in the ink (Figures 1 and 3);
- wherein the bubble catching section (5) has a space extending upwards from the ink supply

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tube (8) so that the bubbles float and are caught in the space before the ink is supplied to the print head (1) via the ink supply tube (8) (Figures 1 and 3, column 2, lines 28-31; column 3, lines 65-68 and column 4, lines 1-2);

- wherein the bubble catching section (5) has a space above a downstream outlet (4) so that the bubbles float and are caught in the space before the bubbles reach the outlet (Figures 1 and 3); and

- wherein the space (7c) extends above a height of the outlet up to a highest part of the bubble catching section.

Claims 1-3 and 11-13 are rejected under 35 USC 102 (b) as being anticipated by Okamura et al. (US Pat. 5,485,187).

Okamura et al. discloses in Figures 1-3 an ink supply system comprising:

- an ink tank (4) storing ink (8);
- an ink supply tube (9) supplying the ink from the ink tank (4) to a print head (1), wherein the ink supply tube (9) is provided with a bubble catching section (7) for catching bubbles in the ink (Figures 1);
- wherein the bubble catching section (7) has a space extending upwards from the ink supply tube (9) so that the bubbles float and are caught in the space before the ink is supplied to the print head (1) via the ink supply tube (9) (Figures 1);
- wherein the bubble catching section (7) has a space above a downstream outlet so that the bubbles float and are caught in the space before the bubbles reach the outlet (Figure 1).
- wherein the space (7) extends above a height of the outlet up to a highest part of the bubble catching section;
- wherein there is provided a valve (6) between the ink tank (4) and the bubble catching section (7) to open/close a flow passage; and
- wherein the bubbles are discharged from the bubble catching section (7) using a vacuum pump (3) (Figures 1 and 2a).

*Citation of Pertinent Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art reference (US Pat. 4,368,478; US Pat. 4,586,058; US Pat. 5,777,649; US Pat. 5,943,078; US Pat. 6,007,193; US Pat. 6,481,837; US Pat. 6,158,855) cited in the PTO 892 form show an ink supply system that is deemed to be relevant to the present invention. These references should be reviewed.

*Allowable Subject Matter*

Claims 4-5 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims. This claim would be allowable because none of the prior art references of record discloses an ink jet printer comprising a following equation

$$(1/18) \cdot g \cdot d^2 / v > (L_y / L_x) \cdot (Q / ST)$$

where  $g$  is a gravitational acceleration ( $m/s^2$ ),  $d$  is a diameter ( $m$ ) of the bubbles,  $v$  is a dynamic viscosity ( $m^2/s$ ) of the ink,  $L_x$  is a length ( $m$ ) of a flow passage in the bubble catching section,  $L_y$  is a height ( $m$ ) of the outlet from a bottom of the flowing ink,  $Q$  is an average ink flow per unit time ( $m^3/s$ ), and  $ST$  is a cross-sectional area ( $m^2$ ) of the flow passage in the combination as claimed.

Claims 6-7 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims. These claims would be allowable because none of the prior art references of record discloses an ink jet printer comprising an ink tank that is provided with filter at an ink delivery port thereof interfacing the ink supply tube; and

$$(1/18) \cdot g \cdot C^2 / v > (L_y / L_x) \cdot (Q / ST)$$

where  $g$  is a gravitational acceleration ( $m/s^2$ ),  $C$  is a mesh size ( $m$ ) of the filter,  $v$  is a dynamic viscosity ( $m^2/s$ ) of the ink,  $L_x$  is a length ( $m$ ) of a flow passage in the bubble catching section,  $L_y$  is a height ( $m$ ) of the outlet from a bottom of the flowing ink,  $Q$  is an average ink flow per unit time ( $m^3/s$ ), and  $ST$  is a cross-sectional area ( $m^2$ ) of the flow passage in the combination

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as claimed.


Claims 8-10 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims. These claims would be allowable because none of the prior art references of record discloses an ink jet printer comprising an ink tank that is provided with filter at an ink delivery port thereof interfacing the ink supply tube; and

$$(1/18) \cdot g \cdot (2/2 \cdot M)^2 / v > (L_y / L_x) \cdot (Q / ST)$$

where g is a precision (m) gravitational acceleration (m/s<sup>2</sup>), M is a filter of the mesh filter, v is a dynamic viscosity (m<sup>2</sup>/s) of the ink, L<sub>x</sub> is a length (m) of a flow passage in the bubble catching section, L<sub>y</sub> is a height (m) of the outlet from a bottom of the flowing ink, Q is an average ink flow per unit time (m<sup>3</sup>/s), and ST is a cross-sectional area (m<sup>2</sup>) of the flow passage in the combination as claimed.

### CONCLUSION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Anh Vo whose telephone number is (571) 272-2262. The examiner can normally be reached on Tuesday to Friday from 8:00 A.M. to 6:00 P.M.. The fax number of this Group 2861 is (703) 872-9306.

  
ANH T.N. VO  
PRIMARY EXAMINER  
June 29, 2005